



\$41
3661

Docket No.: 002240.P015D

Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re of Application of:

Gary S. Chisholm, et al.

Application No.: 09/049,161

Filing Date: 3/26/1998

For: METHOD AND APPARATUS FOR
PRECISE POSITIONING OF
LARGE STRUCTURES

Commissioner for Patents
Washington, D.C. 20231

Examiner: Hernandez, O.

Art Unit: 3661

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23 Appeal
Brief (1)
9/19/02
Hobbes

TRANSMITTAL COVER LETTER

Sir:

Enclosed for filing in the U.S. Patent and Trademark office, before the Board of Patent Appeals and Interferences are (1) Appellant's Brief Pursuant to 37 C.F.R. § 1.192(a), in triplicate; (2) Appendix to Appellant's Brief, in triplicate; (3) a check in the amount of \$320.00 to cover the fee for filing the Appellant's Brief.

If any additional fee is required, please charge Deposit Account No. 02-2666. A duplicate of this transmittal is enclosed for deposit account charging purposes.

Respectfully submitted,
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Tarek N. Fahmi
Reg. No. 41,402

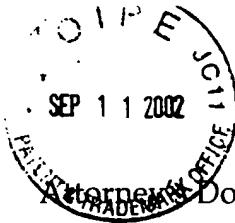
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Commissioner for Patents
Washington, D.C. 20231

**APPEAL BRIEF
IN SUPPORT OF APPELLANTS' APPEAL
TO THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Sir:

This Brief is submitted in triplicate in support of this appeal from a final decision of the Examiner, mailed March 7, 2000. Consideration of this appeal by the Board of Patent Appeals and Interferences for allowance of the above-captioned patent application is respectfully requested.

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I. REAL PARTY IN INTEREST

The real party in interest is Trimble Navigation, Ltd., a corporation of California having a place of business at 645 North Mary Avenue, Sunnyvale, CA.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

Claims 11-20 are currently pending. Claims 11 - 20 have been finally rejected.

IV. STATUS OF AMENDMENTS

There are no currently pending amendments.

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A. Summary of the Invention

The present invention concerns a system for precisely positioning a three dimensional structure at a desired location. The system utilizes a global positioning system (GPS) receiver to provide positioning information regarding the structure and provides a unique set of display information to a user, which includes a visual, graphical representation of both the present and desired positions, orientations and attitudes of the structure being positioned. Through the use of this display information, a user is able to move the structure into the desired position.

Many construction tasks involve locating large, three-dimensional structures (e.g., bridge sections and the like). Traditional methods of monitoring the placement of such structures involve the use of a variety of surveying techniques. These may include using visible lasers and/or optical theodolites. Such methods are not particularly convenient, however, because they require trained personnel to visit the construction site each time a new section of the structure is being moved into position.

The present invention helps to alleviate this situation by introducing several novel features. To begin, a virtual model of the structure of interest is created and stored in a computer memory. Some time later, remote sensors are placed in selected positions on the actual structure of interest. The sensors are configured so as to provide real time location, attitude and orientation information regarding the structure and may consist of GPS remote units, tilt meters, gyro compasses, and pressure sensors. The position of each remote sensor on the actual structure is also recorded in the computer memory so that the virtual model of the structure accurately reflects the real world situation.

As the structure is being positioned, real time location, attitude and orientation information produced by the remote sensors is monitored at a base station and used to update the virtual model with respect to a predefined coordinate system. In this way, the virtual model accurately reflects the current location, attitude and orientation of the structure. The information so obtained can be displayed to a user as a graphical and textual representation of the current state of the structure. In addition, the desired location, attitude and orientation of the structure is displayed. Such a display is then used by an operator to adjust the current location, attitude and orientation of the structure so as to align the current position of the structure with the desired position. In this way, this structure can be precisely positioned.

Claim 11 is presented below with elements read on Figures of the drawings as required in MPEP 1206.

11. A precise positioning apparatus (200) comprising:
 - a system bus (206);
 - a GPS receiver (102) configured to communicate with the system bus (206), the GPS receiver (102) generating position information regarding a position of a structure (100) associated with the GPS receiver;
 - a memory (208) configured to communicate with the system bus (206);

a display (212) configured to communicate with the system bus (206);

a microprocessor (202) configured to communicate with the system bus (206), the microprocessor (202) configured to receive (508) the position information from the GPS receiver (102) and configured to generate display information based on the position information, the display information comprising guidance and orientation information, the microprocessor (202) configured to transmit the display information to the display (212),

wherein the display information is displayed (512) on the display (212) such that a user is provided with a visual graphical representation of a present position (640), orientation (602) and attitude (604) of the structure and a desired position (642), orientation (642) and attitude (606) of the structure.

As stated in MPEP 1206, the claims are not to be limited to this embodiment by such reading.

B. Summary of Rejections

Claims 11 through 20 were rejected under 35 USC 102(e) as being anticipated by Anderson et al, US Patent No. 6,032,084 ("Anderson"). [Final Office Action, p. 2.]

C. Summary of the References

Anderson describes an animal feedlot management system wherein it appears that the displayed information includes the desired position and, perhaps, the desired orientation (e.g., North, South, etc.) of the feedlot vehicle.

VI. ISSUES

1. Whether claims 11 through 20 are patentable over Anderson?

VII. GROUPING OF CLAIMS

For the purposes of this appeal, claims 11 through 20 stand or fall together.

VIII. ARGUMENT

A. Claims 11 through 20 are Patentable over Anderson

Anderson et al., U.S. Patent 6,032,084 fails to teach or suggest elements of the claimed precise positioning apparatus and, therefore, the claims are patentable over this reference. For example, Anderson does not teach or suggest displaying information that includes a present and desired position, orientation and **attitude** of a structure. Anderson merely provides for utilizing GPS to calculate a feedlot vehicle position and orientation as explained at col. 3, ll. 41-46 and col. 12, l. 65 to col. 13, l. 7. However, nowhere in the description or the accompanying figures is there any indication of determining the present or desired attitude of the vehicle or displaying the present or desired attitude of the vehicle. At best, Anderson at col. 3, ll. 18-24, provides a "VR model of the feedlot which accurately reflects the position and orientation of the feedlot vehicles as it is navigated through the feedlot."

"Attitude" is unlike position or orientation. Position may be regarded as the location of the vehicle and orientation as the heading of the vehicle. However, "attitude" is a description of a vehicle's or a structure's alignment in three-dimensional (or other dimensional) space, with respect to a given plane or other reference. See, e.g., Webster's New World Dictionary. Nowhere does Anderson indicate the display of present attitude or desired attitude.

In contrast, the display of a structure's **present and desired attitude** is a recited element of the claimed apparatus. An example of such display information is shown in Figure 6 (though other display types are possible). Moreover, while Anderson might consider the present position and orientation of a feedlot vehicle, Anderson does not teach or suggest a desired position and orientation. Consequently, because the present

claims include elements neither taught nor suggested by Anderson, the claims are patentable over Anderson.

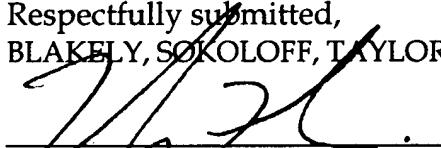
IX. CONCLUSION

For the foregoing reasons, Appellants respectfully request reversal of the Examiner's rejections as set forth in the Final Office Action and request that the Board direct allowance of all of the claims. If there are any additional charges, please charge Deposit Account No. 02-2666.

Date: Sep. 6, 2002

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Respectfully submitted,
~~BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP~~


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Reg. No. 41,402

APPENDIX A
(37 C.F.R. § 1.192 (c)(9))

The claims on appeal read as follows:

11. A precise positioning apparatus comprising:
 - a system bus;
 - a GPS receiver configured to communicate with the system bus, the GPS receiver generating position information regarding a position of a structure associated with the GPS receiver;
 - a memory configured to communicate with the system bus;
 - a display configured to communicate with the system bus;
 - a microprocessor configured to communicate with the system bus, the microprocessor configured to receive the position information from the GPS receiver and configured to generate display information based on the position information, the display information comprising guidance and orientation information, the microprocessor configured to transmit the display information to the display, wherein the display information is displayed on the display such that a user is provided with a visual graphical representation of a present position, orientation and attitude of the structure and a desired position, orientation and attitude of the structure.
12. A precise positioning apparatus as in claim 11 further comprising a communication system, the communication system coupled to the GPS receiver and to the system bus, the communication system providing a link for communicating information from the GPS receiver to the microprocessor.
13. A precise positioning system as in claim 12 wherein the communication system comprises a two-way radio communication system.

14. A communication system as in claim 12 wherein the communication system comprises an optical communication system.

15. A precise positioning system as in claim 12 further comprising an orientation sensor, the orientation sensor generating orientation information regarding the orientation of the structure, the orientation sensor coupled to the communication system, wherein the communication system further providing a link for communicating orientation information from the orientation sensor to the microprocessor.

16. A precise positioning system as in claim 15 wherein the orientation sensor comprises a gyro compass.

17. A precise positioning system as in claim 12 further comprising an attitude sensor, the attitude sensor generating pitch information regarding the structure, the attitude sensor coupled to the communication system, wherein the communication system further providing a link for communicating the pitch information from the orientation sensor to the microprocessor.

18. A precise positioning system as in claim 17 wherein the attitude sensor further generating roll information regarding the structure, and wherein the communication system further providing a link for communicating the roll information to the microprocessor.

19. A precise positioning system as in claim 18 wherein the attitude sensor comprises a tilt meter.

20. A precise positioning system as in claim 12 further comprising a pressure sensor, the pressure sensor generating depth information regarding the structure, the

pressure sensor coupled to the communication system, wherein the communication system further providing a link for communicating the depth information from the pressure sensor to the microprocessor.



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Fee TRANSMITTAL for FY 2002

Patent fees are subject to annual revision.

Applicant claims small entity status. See 37 CFR 1.27.

TOTAL AMOUNT OF PAYMENT	(\$)	320.00
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Complete if Known

Application Number	09/049,161
Filing Date	March 26, 1998
First Named Inventor	Gary Sedman Chisholm
Examiner Name	Olga Hernandez
Group/Art Unit	3661
Attorney Docket No.	2240P015D

METHOD OF PAYMENT (check one)

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 Deposit Account

Deposit Account Number

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FEE CALCULATION

1. BASIC FILING FEE

Large Entity		Small Entity		Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
101	740	201	370	Utility filing fee
106	330	206	165	Design filing fee
107	510	207	255	Plant filing fee
108	740	208	370	Reissue filing fee
114	160	214	80	Provisional filing fee
SUBTOTAL (1)		(\$)		

2. EXTRA CLAIM FEES

Total Claims	Extra Claims	Fee from below	Fee Paid
<input type="text"/>	" = <input type="text"/>	X <input type="text"/>	= <input type="text"/>
Independent Claims	" = <input type="text"/>	X <input type="text"/>	= <input type="text"/>

Multiple Dependent

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple Dependent claim, if not paid
109	84	209	42	"Reissue independent claims over original patent
110	18	210	9	"Reissue claims in excess of 20 and over original patent
SUBTOTAL (2)		(\$)		

**or number previously paid, if greater. For Reissues, see below

3. ADDITIONAL FEES

Large Entity	Small Entity	Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)
105	130	205	65 Surcharge - late filing fee or oath
127	50	227	25 Surcharge - late provisional filing fee or cover sheet.
139	130	139	130 Non-English specification
147	2,520	147	2,520 For filing a request for ex parte reexamination
112	920*	112	920* Requesting publication of SIR prior to Examiner action
113	1,840*	113	1,840* Requesting publication of SIR after Examiner action
115	110	215	55 Extension for reply within first month
116	400	216	200 Extension for reply within second month
117	920	217	460 Extension for reply within third month
118	1,440	218	720 Extension for reply within fourth month
128	1,960	228	980 Extension for reply within fifth month
119	320	219	160 Notice of Appeal
120	320	220	160 Filing a brief in support of an appeal
121	280	221	140 Request for oral hearing
138	1,510	138	1,510 Petition to institute a public use proceeding
140	110	240	55 Petition to revive - unavoidable
141	1,280	241	640 Petition to revive - unintentional
142	1,280	242	640 Utility issue fee (or reissue)
143	460	243	230 Design issue fee
144	620	244	310 Plant issue fee
122	130	122	130 Petitions to the Commissioner
123	50	123	50 Processing fee under 37 CFR 1.17(q)
126	180	126	180 Submission of Information Disclosure Stmt
581	40	581	40 Recording each patent assignment per property (times number of properties)
146	740	246	370 Filing a submission after final rejection (37 CFR § 1.129(a))
149	740	249	370 For each additional invention to be examined (37 CFR § 1.129(b))
179	740	279	370 Request for Continued Examination (RCE)
169	900	169	900 Request for expedited examination of a design application
Other fee (specify)			
SUBTOTAL (3)		(\$)	

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$)

320.00

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Signature				Date	09/06/02

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